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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/035,215	01/04/2002	Susan H. Woods	WWT-02-001US	3488

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MARY ELISA LANE
16520 MONTECREST LANE
DARNESTOWN, MD 20878

EXAMINER
HAAS, WENDY C

ART UNIT	PAPER NUMBER
1661	

DATE MAILED: 03/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/035,215	WOODS ET AL.	
	Examiner	Art Unit	
	Wendy C Haas	1661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-53* is/are pending in the application.

4a) Of the above claim(s) *18-40 and 44-53* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17 and 41-43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group 1, claims 1-17 in Paper No. October 31, 2003 is acknowledged. New claims 44-53 have not been examined because they are drawn to non-elected subject matter (Group V.)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 and 43 are rejected under 35 U.S.C. 103(a) as obvious over Linder et al. in view of Murashige et al. and Caponetti et al.

Linder et al. teach induction of embryogenic calli of *Arundo donax* on MS medium supplemented with 1 mg/l IAA and 2 mg/l 2, 4-D. Plantlets were regenerated by placement of embryogenic callus on hormone-free MS medium. Linder et al. do not teach the use of solid media or aseptic technique. Murashige et al. teach that MS medium is generally thought by one of ordinary skill in the art to be solid medium, unless otherwise indicated. See, e.g. page 475, last paragraph. Caponetti et al. teach that sterilization of both explants and media is considered to be state of the art in all tissue culture methods. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the teachings of Linder et al.

with solid media while employing aseptic technique. One of ordinary skill in the art would be motivated to combine the teachings of Murashige et al. and Caponetti et al. with the method of Linder et al. to produce uncontaminated cultures and improve experimental results.

Claims 2-3, 5-7, 10, 11, and 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Linder et al. in view of Murashige et al. and Caponetti et al. as applied to claims 1 and 43 above, and further in view of Woods et al.

The teachings of Linder et al., Murashige et al. and Caponetti et al. are set forth above. Linder et al. in view of Murashige et al. and Caponetti et al. do not teach transferring the mature embryos to a liquid suspension culture to induce more embryos, or to split and subculture embryos; transfer of plantlets to a rooting medium; sucrose in the medium; benzyladenine, kinetin or thidiazuron in the medium; or half-strength medium.

Woods et al. teach a three-step method of producing bamboo plantlets via somatic embryogenesis and tissue culture.

1. In the first stage, a solid or semi-solid induction medium containing MS salts, NAA, BA and sugar is used. The preferable auxin concentration is between 0.1 and 10 mg/l, typically not exceeding 3 mg/l. [Col. 4, lines 1-40.]
2. In the second stage, a solid or semi-solid medium of MS salts, BA, sugar and 2, 4-D is used for somatic embryo induction. The amount of BA is 0.5 mg/l, though the disclosure notes this can vary from 0.3 to 3 mg/l. The sucrose concentration is 2% and can vary within the range of 2%-5%. [Col. 4, lines 41-63.]
3. The third step of the method is either to germinate the somatic embryos on full to half-strength basal medium [Col. 5, lines 33-36] or to place the somatic embryos

in a liquid suspension culture for further somatic embryo proliferation [Col. 5, lines 37-47.]

It would have been obvious to a person of ordinary skill in the art to use the methods of Woods et al. and Linder et al. in conjunction with one another to produce *Arundo donax* somatic embryos. A person of ordinary skill in the art would be motivated to do this because Linder et al. show that *A. donax* undergoes somatic embryogenesis in the presence of IAA and 2, 4-D, and the method of Woods et al. is an effective somatic embryogenesis and regeneration protocol for bamboo, a closely related species. It would have been obvious to a person of ordinary skill in the art to expect the method of Woods et al., with the auxin composition modified as suggested by Linder et al., to be an effective somatic embryogenesis and rengeration protocol for *A. donax*. In fact, in Cols. 4-5, lines 64-3, Woods et al. note that the lack of NAA, specifically, as an auxin is critical to somatic embryo induction in their method. As such, the method was *prima facie* obvious at the time the invention was made.

Claims 4, and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Linder et al. in view of Murashige et al., Caponetti et al. and Woods et al. as applied to claims 2-3, 5-7, 10, 11, and 41-42 above, and further in view of Marton et al.

The teachings of Linder et al. Murashige et al. and Caponetti et al. and Woods et al. are set forth above. Linder et al., Murashige et al., Caponetti et al. and Woods et al. do not teach transfer of plantlets or nodal segments to shoot multiplication medium to multiply shoots, or a specific composition for that medium.

Marton et al. teach a multi-step microshoot tissue culture method of a sterilized immature inflorescence of *Arundo donax* comprising a first step of culture in half or full strength solid MS medium with B5 vitamins, 80 mg/L adenine hemisulfate, 0.12 mg/l picloram, 1 mg/l IBA, 0.5 mg/l 2, 4-D, 0.5 mg/l isopentyladenine, 1 mg/l BA, 0.5 mg/l trans-zeatin, and 3 mg/l TDZ along with 30 g/l sucrose [page 11]. The second step is culture in full or half-strength basal medium 0.02 mg/l TDZ and 30 g/l sucrose to regenerate plantlets [page 12.] The third step is cultivation in soil or in a hormone-free medium for increased plantlet size [page 13.]

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Marton et al. with the methods of Linder et al. and Woods et al. to further proliferate shoots and produce plantlets from same. One would be motivated to use this method because individual plantlets can be rapidly cloned in this manner. Further, some tissues may exhibit shoot formation without embryogenesis, as noted by Marton et al. on page 16 (Marton et al. hypothesize that no somatic embryos were seen in their method because the shoots seen in their method were the result of precocious germination of somatic embryos before their complete development into graminoids.) As such, the method as a whole was *prima facie* obvious at the time the invention was made.

Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Linder et al. in view of Murashige et al., Caponetti et al. and Woods et al. as applied to claims 2-3, 5-7, 10, 11 and 41-42 above, and further in view of Stuart et al.

The teachings of Linder et al., Murashige et al., Caponetti et al. and Woods et al. are set forth above. Linder et al., Murashige et al., Caponetti et al. and Woods et al. do not teach specific liquid media components, including asparagine.

Stuart et al. teach the use of asparagine to increase somatic embryo size in liquid tissue culture.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use any effective specific media components known in the art in the liquid suspension step of the method claimed. One would be motivated to use asparagine, in particular as an obvious additive to increase somatic embryo size, and thus, viability. As such, the method was *prima facie* obvious at the time the invention was made.

Claims 7-9, 11 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Linder et al. in view of Murashige et al., Caponetti et al. and Woods et al. as applied to claims 2-3, 5-7, 10, 11 and 41-42 above, and further in view of Sutter.

The teachings of Linder et al. and Woods et al. are set forth above. Linder et al. and Woods et al. do not teach the use of LS medium.

Sutter teaches that LS medium is a variation of MS medium, well-known in the art, as MS medium with the deletion of Nicotinic acid, Pyroxidine HCl, Glycine and Caesin hydrolysate, and the addition of more Thiamine HCl. LS medium is known as an effective revision of MS medium that is simple to prepare [page 19].

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the teachings of Sutter in conjunction with the methods of Linder et al. and

Woods et al. to modify the methods by using LS medium. One would be motivated to do this because LS medium is an effective revision of MS medium that is easier to prepare. As such, the method was *prima facie* obvious at the time the invention was made.

Conclusion

No claim is allowed.

Future Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wendy C. Haas whose telephone number is (571) 272-0976. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bruce Campell can be reached on (571) 272-0974. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Bruce Campell

W. C. Haas

BRUCE R. CAMPELL, PH.D
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600